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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
HA, JULIE	
ART UNIT	PAPER NUMBER
1654	
MAIL DATE	DELIVERY MODE
06/22/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/510,875	ARMSTRONG ET AL.	
	Examiner	Art Unit	
	JULIE HA	1654	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 March 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-6,8-16 and 19-25* is/are pending in the application.

4a) Of the above claim(s) *19-23* is/are withdrawn from consideration.

5)☒ Claim(s) *10 and 11* is/are allowed.

6)☒ Claim(s) *1,3-6,8-9, 12-16,24 and 25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Amendment after Non-final rejection filed on March 2, 2009 is acknowledged. Claims 1, 3-6, 8-16 and 19-25 are pending in this application. Applicant elected Group 1 **without traverse** in the reply filed on October 13, 2006. Claims 19-23 remain withdrawn from further consideration, as being drawn to nonelected invention. Claims 1, 3-6, 8-16 and 24-25 are examined on the merits in this office action.

Withdrawn Objection and Rejection

1. Objection to claims 1 and 12 for having minor informalities is hereby withdrawn in view of Applicant's amendment to the claims.

2. Rejection of claims 3-5 for lacking antecedent basis is hereby withdrawn in view of Applicant's amendment to the claims.

Maintained Objection

3. Claims 1 and 12 remain objected to for the following informalities: Claim 1 recites, "capable of being bound". The term is indefinite since it is unclear if the substrate polypeptide is bound in a phosphorylation state-sensitive manner or it is not.

4. Claim 12 recites, "protein kinase is capable of phosphorylating the polypeptide..." The term "capable of" is indefinite since it is unclear if the protein kinase phosphorylated the polypeptide at the serine residue or not.

Response to Applicant's Arguments

5. Applicant argues that "in view of the context in which the phrase is used in claim 1 and in view of the teachings of the specification, the meaning of "capable of being bound" would be clear to one skilled in the art." Applicant argues that "since claim 8 depends from claim 1 and further limits claim 1 to those kits which further include a specific binding partner, claim 1 clearly encompasses kits which do not include specific binding partners." Applicant argues that "with regards to claim 12, it is submitted that, in view of the context in which the phrase is used in claim 12 and in view of the teachings of the specification, the meaning of "protein kinase is capable of phosphorylating the polypeptide at the serine residue" would be clear to one skilled in the art...the polypeptide of claim 12 is disclosed as being useful for assaying the activity of a protein kinase by exposing the protein kinase to the polypeptide and determining the extent to which the polypeptide is phosphorylated (e.g., claim 20)."

6. Applicant's arguments have been fully considered but have not been found persuasive. It is unclear whether or not the bond has been formed or not. Furthermore, claim 1 recites, "...capable of being bound in a phosphorylation state-sensitive manner by a specific binding partner..." The claim is unclear as whether or not the substrate polypeptide is bound in a phosphorylation state-sensitive manner or not. In regards to Applicant's arguments that "claim 8 depends from claim 1 and further limits claim 1", claim 8 may further limit claim 1, but when claim 1 is examined by itself, the "capable of being bound" is unclear. Again, it is unclear whether or not the substrate polypeptide is capable or being bound or not in a phosphorylation state-sensitive manner. In regards

claim 12, it is still unclear whether or not protein kinase is capable of phosphorylating the polypeptide at the serine reside of SEQ ID NO: 6 or not. It is noted that claim 20 was withdrawn from consideration, and have not been examined. Claim 12 recites, "...wherein the sequence corresponding to the consensus sequence is positioned relative to SEQ ID NO: 6 such that the protein kinase is capable of phosphorylating the polypeptide..." it is unclear whether the serine residue of SEQ ID NO: 6 has been phosphorylated or not.

Maintained Rejection

35 U.S.C. 112, 2nd

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 1, 3-6, 8-9 and 24-25 remain rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

9. Base claims 1 recites, "...being bound in a phosphorylation state-sensitive manner". It is unclear what is meant by "phosphorylation state-sensitive manner." The specification discloses that "by 'binding in a phosphorylation state-sensitive manner' is included the meaning that the specific binding partner is capable of binding to the substrate polypeptide when phosphorylated on the phosphorylatable portion, but is not capable of binding to the substrate polypeptide when it is not phosphorylated on the phosphorylatable portion." This implies that there are other meanings for the term. Since the term is not clearly defined, it is unclear what "phosphorylation state-sensitive

manner" means. Because claims 3-6, 8-9 and 24-25 depend from indefinite claim 1 and do not clarify the point of confusion, they must also be rejected under 35 U.S.C. 112, second paragraph.

Response to Applicant's Arguments

10. Applicant argues that "the quoted passage is meant to illustrate, not define, the subject phrase. Additional illustration of the subject phrase is set forth in the specification immediately following the quoted passage, and in the Examples."

11. Applicant's arguments have been fully considered but have not been found persuasive. Applicant has directed the Examiner to page 9, lines 20-28. At page 9, lines 20-28, the specification discloses that "it is preferred that the specific binding partner has at least a 5-fold, preferably 10, 20, 50, 100, 200, 500, 1000, 2000 or 5000-fold difference in affinity for the phosphorylated and non-phosphorylated substrate polypeptide. This passage is a preferred embodiments. The passage of page 9, lines 20-28 does not illustrate the subject phrase. The Examples do not describe what is meant by "phosphorylation state-sensitive manner". The instant specification clearly does not define what is meant by "phosphorylation state-sensitive manner." Since the above quoted passage implies that there are other meanings for the term, it is unclear what the passage implies and meant by "phosphorylation state-sensitive manner".

35 U.S.C. 112, 1st

12. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the

art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

13. Claims 1, 3-6, 8-9, 12-16 and 24-25 remain rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The MPEP states that the purpose of the written description requirement is to ensure that the inventor had possession, as of the filing date of the application, of the specific subject matter later claimed by him. The courts have stated:

"To fulfill the written description requirement, a patent specification must describe an invention and do so in sufficient detail that one skilled in the art can clearly conclude that "the inventor invented the claimed invention." Lockwood v. American Airlines, Inc., 107 F.3d 1565, 1572, 41 USPQ2d 1961, 1966 (1997); *In re Gosteli*, 872 F.2d 1008, 1012, 10 USPQ2d 1614, 1618 (Fed. Cir. 1989) (" [T]he description must clearly allow persons of ordinary skill in the art to recognize that [the inventor] invented what is claimed."). Thus, an applicant complies with the written description requirement "by describing the invention, with all its claimed limitations, not that which makes it obvious," and by using "such descriptive means as words, structures, figures, diagrams, formulas, etc., that set forth the claimed invention." Lockwood, 107 F.3d at 1572, 41 USPQ2d at 1966." Regents of the University of California v. Eli Lilly & Co., 43 USPQ2d 1398.

The MPEP lists factors that can be used to determine if sufficient evidence of possession has been furnished in the disclosure of the Application. These include "level of skill and knowledge in the art, partial structure, physical and/or chemical properties, functional characteristics alone or coupled with a known or disclosed correlation between structure and function, and the method of making the claimed invention. Disclosure of any combination of such identifying characteristics that distinguish the claimed invention from other materials and would lead one of skill in the art to the conclusion that the applicant was in possession of the claimed species is sufficient." MPEP 2163.

Further, for a broad generic claim, the specification must provide adequate written description to identify the genus of the claim. In Regents of the University of California v. Eli Lilly & Co., the court stated:

"A written description of an invention involving a chemical genus, like a description of a chemical species, 'requires a precise definition, such as by structure, formula, [or] chemical name,' of the claimed subject matter sufficient to distinguish it from other materials. Fiers, 984 F.2d at 1171, 25 USPQ2d at 1606; *In re Smythe*, 480 F.2d 1376, 1383, 178 USPQ 279, 284-85 (CCPA 1973) ("In other cases, particularly but not necessarily, chemical cases, where there is unpredictability in performance of certain species or subcombinations other than those specifically enumerated, one skilled in the art may be found not to have been placed in possession of a genus. . . ."). Regents of the University of California v. Eli Lilly & Co., 43 USPQ2d 1398.

The MPEP further states that if a biomolecule is described only by a functional characteristic, without any disclosed correlation between function and structure of the sequence, it is "not sufficient characteristic for written description purposes, even when accompanied by a method of obtaining the claimed sequence." MPEP 2163. The MPEP does state that for generic claim the genus can be adequately described if the disclosure presents a sufficient number of representative species that encompass the genus. MPEP 2163. If the genus has a substantial variance, the disclosure must describe a sufficient variety of species to reflect the variation within that genus. See MPEP 2163. Although the MPEP does not define what constitute a sufficient number of representative, the Courts have indicated what do not constitute a representative number species to adequately describe a broad generic. In Gostelli, the Court determined that the disclosure of two chemical compounds within a subgenus did not describe that subgenus. *In re Gostelli*, 872 F.2d at 1012, 10 USPQ2d at 1618.

In the instant case, the claims are drawn to a kit of parts comprising two or more protein kinase substrate polypeptides, each said substrate polypeptide comprising a

specificity portion, wherein the specificity conferring portion is different for each said substrate polypeptide, and a phosphorylatable portion, wherein the phosphorylatable portion of each said substrate polypeptide is SEQ ID NO: 6. The claims are further drawn to a polypeptide of less than 40, 30, 20, 19, 18, 17, 16, 15, 14, 13, 12, 11, 10 or 9 amino acids in length (claims 1, 3-6, 8-9 and 24-25). Additionally claim 12 is drawn to a polypeptide of less than 40, 30, 20, 19, 18, 17, 16, 15 or 14 amino acids in length, wherein the polypeptide comprises SEQ ID NO:6 and further comprising a specificity conferring portion comprising an amino acid sequence corresponding to the consensus sequence for a protein kinase, wherein the sequence corresponding to the consensus sequence is positioned relative to SEQ ID NO: 6 such that the protein kinase is capable of phosphorylating the polypeptide at the serine residue of SEQ ID NO: 6. The dependent claims 13-16 are further drawn to a polypeptide wherein the polypeptide is 13, 12, 11, 10 or 9 amino acid in length, the consensus sequence extends to the N-terminus of SEQ ID NO: 6, and the consensus sequence is SEQ ID NO: 8, SEQ ID NO: 9, SEQ I NO: 2 or SEQ ID NO:5. The generic statements specificity conferring portion is different for each said substrate polypeptide, the polypeptide is of less than 40, 30, 20, 19, 18, 17, 16, 15, 14, 13, 12, 11, 10 or 9 amino acids in length (for claims 1, 3-6, 8-9, and 24-25), and a polypeptide of less than 40, 30, 20, 19, 18, 17, 16, 15, 14, 13, 12, 11, 10 or 9 amino acids in length, wherein the consensus sequence is SEQ ID NO: 8, SEQ ID NO: 9, SEQ ID NO: 2 or SEQ ID NO: 5 (for claims 12-16) do not provide ample written description for the compounds since the claims do not describe a single

structural feature. The specification does not clearly define or provide examples of what qualify as compounds of the claimed invention.

As stated earlier, the MPEP states that written description for a genus can be achieved by a representative number of species within a broad generic. It is unquestionable claims 1, 4-5 and 12-16 are broad generics with respect all possible compounds encompassed by the claims. The possible structural variations are limitless to any class of peptide or a peptide-like molecule that can form peptide or amide bonds to form a polypeptide. It must not be forgotten that the MPEP states that if a peptide is described only by a functional characteristic, without any disclosed correlation between function and structure of the sequence, it is "not sufficient characteristic for written description purposes, even when accompanied by a method of obtaining the claimed sequence." MPEP 2163. Here, though the claims may recite some functional characteristics, the claims lack written description because there is no disclosure of a correlation between function and structure of the compounds beyond compounds disclosed in the examples in the specification. Moreover, the specification lack sufficient variety of species to reflect this variance in the genus since the specification does not provide any examples of derivatives. The specification is void of organic molecules that functions as a peptide-like molecule that qualify for the functional characteristics claimed as a peptide or a peptide-like molecule or other peptidic molecules or amino acid mimetics and other synthetic peptide or peptide-like molecule that can function as peptides or amino acids.

The specification discloses that "it is preferred that the consensus sequence is Arg-Arg-Arg-Xaa-Xaa-Ser, Arg/Lys-Xaa-Arg-Xaa-Xaa-Ser, Hyd-Xaa-Arg-Xaa-Xaa-Ser or Xaa-pSer-Xaa-Xaa-Ser (see paragraphs [0017] and [0034] of instant specification US 2006/0073575 A1). Further, the specification discloses that "a specificity conferring portion comprising an amino acid sequence (which may overlap with the sequence LSFAEPG) corresponding to a consensus sequence for a protein kinase, wherein the sequence corresponding to the consensus sequence is positioned relative to the sequence LSFAEPG such that the protein kinase is capable of phosphorylating the polypeptide at the serine residues of the sequence LSFAEPG (see paragraph [0033] of instant specification US 2006/0073575 A1). In regards to the substrate polypeptide, the specification discloses that "it is preferred that each said substrate polypeptide is of less than 40, 30, 20, 19, 18, 17, 16, 15, 14, 13, 12, 11, 10 or 9 amino acids in length (see paragraphs [0014] and [0033] of instant specification 2006/0073575 A1)..."the protein kinase substrate polypeptide is a substrate for a protein kinase, i.e. is capable of being phosphorylated by a protein kinase, preferably a serine/threonine protein kinase" (see paragraph [0015] of instant specification 2006/0073575 A1). Further, the specification discloses that "the substrate polypeptide, for example which comprises the amino acid sequence LSFAEPG may be a peptidomimetic compound, though this is not preferred" (see paragraph [0051] of instant specification 2006/0073575 A1). Additionally, the specification discloses that "a substrate polypeptide may be selected for a particular protein kinase on the basis of the consensus sequence for the protein kinase. This may be confirmed by comparing the activity of the protein kinase with the selected substrate

with the activity with one or more other substrates" (see paragraph [0059] of instant specification 2006/0073575 A1). In regards to claims 12-16, the specification discloses that "the invention provides a kit of parts comprising two or more polypeptides, wherein the polypeptides are two or more protein kinase substrate polypeptides" (see paragraph [0013] of instant specification 2006/0073575 A1). Further, the specification discloses that "it is preferred that the polypeptide has or comprises the amino acid sequence Arg-Arg-Arg-Leu-Ser-Phe-Ala-Glu-Pro-Gly, Arg-Xaa-Arg-Xaa-Leu-Ser-Phe-Ala-Gly-Pro-Gly, Hyd-Xaa-Arg-Xaa-Ley-Ser-Phe-Ala-Glu-Pro-Gly or Xaa-pSer-Xaa-Leu-Ser-Phe-Ala-Gly-Pro-Gly" (see paragraph [0036] of instant specification 2006/0073575 A1) and "in particularly preferred embodiment, the polypeptide has the amino acid sequence Arg-Arg-Arg-Leu-Ser-Phe-Ala-Glu-Pro-Gly (RRRLSFAEPG), Arg-Ala-Arg-Thr-Leu-Ser-Phe-Ala-Glu-Pro-Gly (RARTLSFAEPG) or Lys-Lys-Leu-Asn-Arg-Thr-Leu-Ser-Phe-Ala-Glu-Pro-Gly (KKLNRTLSFAEPG)" (see paragraph [0037] of instant specification 2006/0073575 A1). The specification discloses the complete structure of the following polypeptides comprising SEQ ID NO:6: RARTLSFAEPG, KKLNRTLSFAEPG and RRRLSFAEPG (recited in the legend for Figure 2 and paragraph [0037] above). The claimed genus is much broader than this well-defined subgenus. The minimal structural requirements for the genus are that the polypeptides comprise a phosphorylatable portion (i.e., a serine, threonine or tyrosine) and a specificity conferring portion that is different for each polypeptide in the kit. An infinite number of polypeptides could satisfy these minimal requirements. For example, claim 4 indicates that the polypeptide is less than 40, 30, 20, 19, 18, 17, 16, 15, or 14 amino acids. SEQ ID NO: 6 has 7 amino acid

residues. Thus, for a polypeptide having less than 40 amino acids, for example 39 amino acids, 39-7 is 32 residues. There are 20 naturally occurring amino acids, thus $32^{20} = 1.27 \times 10^{30}$ different possibilities for the 32 residues. Even for a polypeptide having less than 14 amino acids, for example 13 residues, 13-7 is 6 residues: $6^{20} = 3.66 \times 10^{15}$ different possibilities. When non-natural amino acids, such as D-amino acids, peptidomimetics, amino acid mimetics, protected amino acids, β-amino acids, γ-amino acids, ε-amino acids are factored into the formula, the possibilities are innumerable. For consensus sequence that is Arg-Arg-Arg-Xaa-Xaa-Ser, Arg/Lys-Xaa-Arg-Xaa-Xaa-Ser, Hyd-Xaa-Arg-Xaa-Xaa-Ser or Xaa-pSer-Xaa-Xaa-Ser, there are 2 and 3 undefined positions. This implies that there are $2^{20} = 1.05 \times 10^{6}$ possibilities for 2 undefined positions, and $3^{20} = 3.49 \times 10^{9}$ possibilities for 3 undefined positions. Again, when non-natural amino acids are factored into the equation, the numbers are vast. Furthermore, according to the specification, "a substrate polypeptide may be selected for a particular protein kinase on the basis of the consensus sequence for the protein kinase. This may be confirmed by comparing the activity of the protein kinase with the selected substrate with the activity with one or more other substrates" (see paragraph [0059] of instant specification 2006/0073575 A1). Despite this breadth, the specification does not disclose the complete or partial structure or chemical/physical properties of any additional peptides, or guidance on how to obtain specific polypeptides suitable for the kit.

As described above, the polypeptide of less than 40, 30, 20, 19, 18, 17, 16, 15, 14, 13, 12, 11, 10 or 9 comprising SEQ ID NO: 6 are innumerable. The consensus

sequences recited in claims 4, 5 and 12 are extremely broad. SEQ ID NO: 2 has 4 undefined positions; SEQ ID NO: 5 has 3 undefined positions; SEQ ID NO: 8 has 1 undefined positions; and SEQ ID NO: 9 has 3 undefined positions. The specification (sequence listing) indicates that positions 1-3 of SEQ ID NO: 8 is either Arg or Lys; positions of 1 and 3 of SEQ ID NO: 9 is either Arg or Lys (see sequence listing). There are innumerable amount of polypeptide possibilities. For example, for SEQ ID NO: 2 having 4 undefined positions, there are $4^{20} = 1.1 \times 10^{12}$ possibilities; for SEQ ID NO: 9 having 3 undefined positions, there are $3^{20} = 3.49 \times 10^{9}$ possibilities. When positions 1 and 3 are factored into the equation for SEQ ID NO: 9, the numbers are increased. Further, when non-natural amino acids are factored into the equation, the numbers are innumerable. The specification provides no guidance on how to obtain a polypeptide that is capable of being bound by a binding partner where the binding partner is not specific for phosphotyrosine, phosphoserine or phosphothreonine, as recited in claim 1. Even if the kit includes antibodies specific for an epitope other than phosphotyrosine, phosphoserine or phosphothreonine, such antibodies would also bind to the substrate polypeptides of the kit. Likewise, the specification fails to fully describe the phosphorylation-state-sensitive binding partners for this genus of polypeptides. Accordingly, in the absence of sufficient recitation of distinguishing identifying characteristics, the specification does not provide adequate written description of the claimed genus. Description of RARTLSFAEPG (11mer), KKLNRTLSFAEPG (13mer), or RRRLSFAEPG (10mer) for substrate polypeptide is not sufficient to encompass numerous other substrate polypeptides that belong to the same genus. For example,

there are varying lengths, varying amino acid compositions, and numerous distinct qualities that make up the genus, as describe above. There is not sufficient amount of examples provided to encompass the numerous characteristics of the whole genus claimed.

The description requirement of the patent statute requires a description of an invention, not an indication of a result that one might achieve if one made that invention. See *In re Wilder*, 736 F.2d 1516, 1521, 222 USPQ 369, 372-73 (Fed. Cir. 1984) (affirming rejection because the specification does "little more than outlin[e] goals appellants hope the claimed invention achieves and the problems the invention will hopefully ameliorate"). Accordingly, it is deemed that the specification fails to provide adequate written description for the genus of the claims and does not reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the entire scope of the claimed invention.

Response to Applicant's Arguments

14. Applicant argues that "pages 2 and 3 of the application, the inventors have found a way of allowing the activity of many protein kinases to be screened using a common format. The inventors have surprisingly found that peptides that share a common epitope are phosphorylated efficiently by many different protein kinases...not only can this common epitope be phosphorylated efficiently, but it is also the target for an effective phosphor-specific antibody." Applicant argues that "a phosphorylatable portion specified in claim 1 (SEQ ID NO: 6) which is both an efficient substrate for many

different protein kinases and a target for an effective phosphorylation-state sensitive antibody." Furthermore, Applicant argues that "the specificity conferring portion comprises an amino acid sequence corresponding to a consensus sequence for a protein kinase, and they are well known to those skilled in the art (for example, SEQ ID NOS: 2, 5, 8 and 9). They are well known to those skilled in the art as being the sequences necessary for phosphorylation by the specified protein kinases." Applicant argues that "there is no need for any narrower definition of the substrate sequences: one skilled in the art would have no difficulty whatsoever in understanding that applicants had possession of the invention, as the skilled artisan would fully understand that sequences defined in this way would have the desired properties."

15. Applicant's argument have been fully considered but have not been found persuasive. Claims 1, 3-6, 8-9, 12-16 and 25-25 are drawn to a kit (a composition) comprising two or more protein kinase substrate polypeptides, and a polypeptide of less than 40, 30, 20, 19, 18, 17, 16, 15 or 14 amino acids in lengths. SEQ ID NO: 6 comprises 7 residues. The specification discloses that "it is preferred that the consensus sequence is Arg-Arg-Arg-Xaa-Xaa-Ser, Arg/Lys-Xaa-Arg-Xaa-Xaa-Ser, Hyd-Xaa-Arg-Xaa-Xaa-Ser or Xaa-pSer-Xaa-Xaa-Ser (see paragraphs [0017] and [0034] of instant specification US 2006/0073575 A1). Further, the specification discloses that "a specificity conferring portion comprising an amino acid sequence (which may overlap with the sequence LSFAEPG, SEQ ID NO: 7) corresponding to a consensus sequence for a protein kinase, wherein the sequence corresponding to the consensus sequence is positioned relative to the sequence LSFAEPG such that the protein kinase is capable of

phosphorylating the polypeptide at the serine residues of the sequence LSFAEPG (see paragraph [0033] of instant specification US 2006/0073575 A1). However, the claims recite that each of the protein kinase substrate polypeptide is of less than 40, 30, 20, 19, 18, 17, 16, 15, or 14 amino acids in lengths. This implies that 39-7 is 32 different amino acid residues for the other 32 residues. For consensus sequence that is Arg-Arg-Arg-Xaa-Xaa-Ser, Arg/Lys-Xaa-Arg-Xaa-Xaa-Ser, Hyd-Xaa-Arg-Xaa-Xaa-Ser or Xaa-pSer-Xaa-Xaa-Ser, there are 2 and 3 undefined positions. This implies that there are 2^{20} = 1.05 X 10^6 possibilities for 2 undefined positions, and 3^{20} = 3.49 X 10^9 possibilities for 3 undefined positions. Furthermore, when polypeptide has less than 40 amino acids in lengths, this implies that the most residues that the polypeptide can have is 39. Therefore, 39-7 (SEQ ID NO: 6) is 32 amino acids. Again, there are 20 naturally occurring amino acids. Thus, there are 32^{20} = 1.27 x 10^{30} different possibilities. When non-natural amino acids (D-amino acids, β-, γ-, ε-amino acids, and protected amino acids, for example) are considered, the numbers are innumerable. For polypeptides having consensus sequence with 2 undefined positions, this further increases the numbers of polypeptide possibilities. Even with a polypeptide having 9 amino acids in lengths, 9-7 is 2 amino acids. A polypeptide sequence having 2 amino acids that are variables, would lead to 2^{20} = 1 x 10^6 different polypeptide possibilities. Again, if non-natural amino acids are considered, this number would increase dramatically. Furthermore, if the consensus sequences have a 2 or 3 undefined positions, this would further increase the numbers of polypeptide possibilities. Description of RARTLSFAEPG (11mer), KKLNRTLSFAEPG (13mer), or RRRLSFAEPG (10mer) for substrate

polypeptide is not sufficient to encompass numerous other substrate polypeptides that belong to the same genus. Again, there are varying lengths, varying amino acid compositions, and numerous distinct qualities that make up the genus, as describe above. There is not sufficient amount of examples provided to encompass the numerous characteristics of the whole genus claimed. Accordingly, it is deemed that the specification fails to provide adequate written description for the genus of the claims and does not reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the entire scope of the claimed invention.

Conclusion

16. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a). Claims 10-11 are allowable. Claims 1, 3-6, 8-9, 12-16 and 24-25 are rejected.

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JULIE HA whose telephone number is (571)272-5982. The examiner can normally be reached on Mon-Thurs, 5:30 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cecilia Tsang can be reached on 571-272-0562. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Julie Ha/
Examiner, Art Unit 1654

/Cecilia Tsang/
Supervisory Patent Examiner, Art Unit 1654